MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2022/2023

BIE2034 – INTERMEDIATE MACROECONOMICS

(All sections / Groups)

5 JULY 2023
9.00 am – 11.00 am
(2 hours)

INSTRUCTIONS TO STUDENTS

1. This Final Exam consists of **TWO (2)** pages including a cover page with **FOUR (4)** Structured Questions.
2. Please **write the answers in the answer booklet** provided.
3. Candidates **MUST** attempt **ALL** questions.
4. The marks distribution for each question is given. Total marks 100.

INSTRUCTION: Answer ALL of the questions.

Question 1 (25 marks)

a) If Malaysians decided to spend a smaller fraction of their incomes. Illustrate the effect on saving, investment, interest rates, real exchange rates, and trade balance. (14 marks)

b) Present the differences between the Classical and New Keynesian Theories of Aggregate Supply graphically. (11 marks)

Question 2 (25 marks)

a) Present the key ideas of the real business cycle model. How does it explain business cycle fluctuations? (6 marks)

b) Illustrate how new Keynesian ideas about expectations affect the IS and aggregate demand curves. (9 marks)

c) Based on the New Classical Model, graphically illustrate the response to an unanticipated and anticipated expansionary policy to Aggregate Demand and Aggregate Supply in the short-run and long run. (10 marks)

Question 3 (25 marks)

a) Demonstrate the basic relationship the long-run Phillips curve describe. Why does it differ from the short-run Phillips curve relationship? (10 marks)

b) Internet sites that allow people to post their resumes online reduce the cost of job searches and create opportunities for individuals looking for jobs to be matched with potential employers more quickly. Assume that these uses of the Internet reduce the average amount of time people are unemployed.

i) Demonstrate how the Internet has affected the natural rate of unemployment. (6 marks)

ii) Show graphically how the use of the Internet by job searchers and employers affects long-run aggregate supply? (4 marks)

c) Present the causes of the long-run aggregate supply curve shift. (5 marks)

Question 4 (25 marks)

a) Illustrate why we need to combine the IS and the LM curves on one graph. (12 marks)

b) If the federal reserve cannot convince the public of its commitment to fight inflation in Malaysia in the near future.

i) Show the effect on the expected appreciation of the Malaysia Ringgit. (4 marks)

ii) Using a graph, illustrate the effect on the spot exchange rate for the Malaysia Ringgit. (9 marks)

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FINAL EXAMINATION

TRIMESTER 2, 2022/2023

BMT1014 – MANAGERIAL MATHEMATICS

(All sections / Groups)

5 JULY 2023
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of **SIX (6)** printed pages with 4 questions only, excluding the cover page.

2. Attempt **ALL FOUR (4)** questions.

3. Write all your answers in the answer booklet provided. All necessary workings **MUST** be shown.

4. Mathematical formula is attached at the end of this question paper.

Question 1 (25 marks)

(a) There are two straight lines, L1 and L2.

(i) Find an equation of L1 that passes through the points (2, 2) and (5, -4).

[6 marks]

(ii) Find an equation of L2 that passes through the points (0, 2) and (3, -4).

[6 marks]

(iii) Use the slopes in question (i) and (ii) above to determine whether L1 and L2 are parallel, perpendicular or neither. Show your workings.

[3 marks]

(b) Trend Blouse is one of the suppliers for ladies' blouses. The fixed monthly cost is RM19500. If each blouse has a cost RM20 and sells for RM50, find:

(i) The cost function.

[2 marks]

(ii) The revenue function.

[2 marks]

(iii) Compute the break-even point.

[6 marks]

Question 2 (25 marks)

(a) Vanessa bakes two types of cupcakes (chocolate and red velvet) to supplement her income. Each chocolate cupcake can be sold for RM3, and each red velvet cupcake can be sold for RM4. Each chocolate cupcake requires 20 minutes of baking time and uses 4 eggs. Each red velvet cupcake requires 15 minutes of baking time and uses 2 eggs. Seven hours of baking time and 48 eggs are available. Construct a Linear Programming Problem to maximize Vanessa's revenue. Do not solve the Linear Programming Problem.

[10 marks]

(b) Consider the following Linear Programming Problem

$$\begin{aligned} \text{Maximize} \quad & P = 40x + 30y \\ \text{Subject to} \quad & 6x + 4y \leq 108 \\ & x + y \leq 24 \\ & x \geq 0,\ y \geq 0 \end{aligned}$$

Use method of corners to solve the Linear Programming Problem above.

[15 marks]

Continued...

Question 3 (25 marks)

(a) Find the simple interest on a RM1900 investment made for 4 years at an interest rate of 6% per year. Next, what is the accumulated amount?

[6 marks]

(b) Rental costs for office space have been going up at 5% per year compounded quarterly for the past 3 years. If office space rent is now RM50 per square foot, what were the rental rates 3 years ago?

[6 marks]

(c) Compute the effective rate of interest corresponding to a nominal rate of 4.5% per year compounded

(i) semiannually,

[3 marks]

(ii) monthly.

[3 marks]

(d) Suppose that the future value of a RM800 investment is RM912 after three years. If interest was compounded quarterly, compute the nominal rate of interest (compounded quarterly) that was earned by the money.

[7 marks]

Question 4 (25 marks)

(a) The relationship between the unit selling price p (in Ringgit Malaysia) and the quantity demanded x (in pairs) of a certain brand of kids' shoes are given by the demand equation

$$p = 230e^{4x} \qquad (0 \le x \le 20000).$$

Compute $R'(x)$.

[7 marks]

(b) Use the following function to find $f''(x)$.

$$f(x) = 14x^{\frac{1}{2}} + 3x^3 - 12x^2 - \frac{3}{4}.$$

[4 marks]

Continued...

(c) Consider the following function:

$$f(x,y)=5x^4+3x^3y^2-2xy-9y+8.$$

Find the first order partial derivatives of the function above. Next, compute $f_{yx}\left(\frac{2}{3},-2\right)$.

[8 marks]

(d) Compute the following integral.

$$\int \frac{4x^2}{8x^3+5}dx$$

[6 marks]

End of Questions.

Subject Code: BMT1014
Subject Name: Managerial Mathematics

Summary of Principal Formulas and Terms

1. Equation of a Straight Line

(i) Slope of a line, $m = \frac{y_2 - y_1}{x_2 - x_1}$

(ii) Point-slope form, $y - y_1 = m(x - x_1)$

(iii) Slope-intercept form, $y = mx + b$ (where m = slope, b = y-intercept)

(iv) General form, $Ax + By + C = 0$

2. Simple Interest

(i) Interest, $I = Prt$ (P = principal, r = interest rate, t = number of years)

(ii) Accumulated amount, $A = P(1 + rt)$

3. Compound Interest

(i) Accumulated amount, $A = P(1+i)^n$, where $i = \frac{r}{m}$, and $n = mt$

(m = number of conversion periods per year)

(ii) Present value for compound interest, $P = A(1+i)^{-n}$

4. Effective Rate of Interest

$$r_{eff} = \left[1 + \frac{r}{m}\right]^m - 1$$

5. Future Value of an Annuity

$$S = R\left[\frac{(1+i)^n - 1}{i}\right]$$

(S = future value of ordinary annuity of n payments of R periodic payment)

6. Present Value of an Annuity

$$P = R\left[\frac{1-(1+i)^{-n}}{i}\right]$$

(P = present value of ordinary annuity of n payments of R periodic payment)

Continued...

7. Amortization Formula

$$R = \frac{Pi}{1-(1+i)^{-n}}$$

(R = periodic payment on a loan of P to be amortized over n periods)

8. Sinking Fund Formula

$$R = \frac{Si}{(1+i)^{n}-1}$$

(R = periodic payment required to accumulate S over n periods)

9. Basic Rules of Differentiation

(a) Derivative of a constant: If $f(x)$ is a constant, then $f'(x)=0$

(b) Power rule : If $f(x)$ is x^n, then $f'(x)=nx^{n-1}$

(c) Constant multiple rule: $\frac{d}{dx}\left[cf(x)\right]=cf'(x)$ (c is a constant)

(d) Sum rule: $\frac{d}{dx}\left[f(x)\pm g(x)\right]=f'(x)\pm g'(x)$

(e) Product rule: If $f(x)=u(x)\cdot v(x)$, then $f'(x)=u(x)v'(x)+v(x)u'(x)$

(f) Quotient rule: $f'(x)=\frac{d}{dx}\left[\frac{u(x)}{v(x)}\right]=\frac{v(x)u'(x)-u(x)v'(x)}{\left[v(x)\right]^2}$

(g) Chain rule: $\frac{dy}{dx}=\frac{dy}{du}\times\frac{du}{dx}$

(h) General power rule: $\frac{d}{dx}\left[f(x)\right]^n=n\left[f(x)\right]^{n-1}f'(x)$

(i) Exponential function: $\frac{d}{dx}\left(e^x\right)=e^x$

$\frac{d}{dx}\left(e^{f(x)}\right)=e^{f(x)}\left[f'(x)\right]$

(j) Logarithmic function: $\frac{d}{dx}(\ln x)=\left(\frac{1}{x}\right)$

$\frac{d}{dx}(\ln f(x))=\frac{f'(x)}{f(x)}$

Continued...

10. Basic Rules of Integration

(a) Indefinite integral of a constant: $\int k\ dx = kx + C$

(b) Power rule: $\int x^n dx = \frac{x^{n+1}}{n+1} + C$

(c) Constant multiple rule: $\int kf(x)\ dx = k\int f(x)\ dx$ where k is a constant

(d) Sum rule: $\int [f(x) \pm g(x)]\ dx = \int f(x)dx + \int g(x)dx$

(e) Exponential function: $\int e^x dx = e^x + C$

(f) Logarithmic function: $\int \left(\frac{1}{x}\right) dx = \ln x + C$

11. Determining Relative Extremas

$$D(x,y) = f_{xx}f_{yy} - (f_{xy})^2$$

If $D > 0$ and $f_{xx} > 0$, relative minimum point occurs at (x, y).
If $D > 0$ and $f_{xx} < 0$, relative maximum point occurs at (x, y).
If $D < 0$, (x, y) is neither maximum nor minimum.
If $D = 0$, the test is inconclusive.

End of Page.